PALADIN AS A METHYL BROMIDE ALTERNATIVE IN TOMATOES: DRIP VS SHANK APPLICATION METHODS

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Introduction: Fumigation for tomatoes in Western North Carolina (WNC) and surrounding areas is standard practice in order to suppress Verticillium wilt (race 2; VW) and weed pressure. Verticillium race 2 has been prevalent throughout the WNC production region and no commercial sources of resistance have been identified. Fumigation kills inoculum to a depth sufficient to produce an economical harvest, although the disease invariably affects tomatoes toward the end of harvest, even with fumigation. We have evaluated Paladin as pre-plant fumigant treatment as an alternative to methyl bromide for several years, and this study is an extension of that work. Weed control, disease pressure and crop yields were evaluated for this study.

Materials and Methods: The study was conducted at the Horticultural Crops Research Station in Mills River, NC using the tomato variety *Mountain Fresh*, a commercial line that is common in the region. Paladin (80 % DMDS / 20% chloropicrin) was formulated for both shank applications and as an EC formulation for injection through the drip application system. All plastic mulch used in this study was a Cadillac brand virtually impenetrable film, and all plots were formed on 27 May 2008. For the plots to receive a drip application, two drip tapes were laid to facilitate the application of the product. Paladin was shank applied at rates of 40, 50 and 60 gal/A broadcast rate. Fumigation with methyl bromide as a standard treatment was also done on 27 May 2008 using 240 lbs/A broadcast rate under VIF. After the beds were formed, the drip irrigation system was hooked up to selected plots to receive the drip applications. These injections were made on 28 May 2008 at the same rates as the shank applications (40, 50 and 60 gal/A broadcast) over a period of 2.5 hours. This injection time, along with the two drip tapes per bed, allowed the beds to be adequately treated without excessive water application. Transplants were set into the field on 18 June 2008 for all plots which corresponded to 21 days after the Paladin treatments. Standard management practices were used in the trial including foliar disease and insect management, fertilizer recommendations and staking and stringing of plots. Tomato fruit were harvested weekly (to date the plots have been harvested two times, and at least four more harvests are anticipated before the end of the season). Harvest data were sorted into marketable categories: jumbo, extra large, large, medium, small and into cull fruit which included damaged misshapen or diseased fruit. Total marketable yields and VW incidence were assessed weekly, as well as weed incidence during the first five weeks. The experiment was designed as a randomized complete block design with 4 replications per

treatment. The internal section of each treated plot (50 ft) was planted to 12 plants spaced 18 in between plants and the 8 in raised beds were 24 in wide with the center spaced at 5 ft intervals.

Results: To date, harvests are still in progress and a complete analysis of the data has not been conducted, but full results will be presented in November. Tomato transplants showed no signs of phytotoxicity from any treatments and tomato growth habits did not seem to differ between application type within a chemical rate. Weed data were collected by counting the number of plant holes that contained weeds, and then quantifying the number of broadleaves and grasses which were present. Data does not seem to show a difference in weed control for a chemical rate between application methods.

Summary: Data will continue to be collected for this study through the middle to end of October, 2008. Disease pressure appears to be high this year, and the non-fumigated control plots are suffering from heavy VW pressure. This should allow us to quantify the effectiveness of Paladin on VW. Data will continue to be collected and analyzed and the final results will be presented in Orlando.